Chairman Ajit Pai and FCC Commissioners 11 February, 2019
Federal Communications Commission
445 12th Street, SW
Washington, DC 20554

re. Docket 16-239, RM-11708 (Amateur Baud Rate NPRM)

Hello FCC Commissioners,

I'm taking the time to write because there are two related threats to the ham bands that need resolution. One is commercial use that congests the bands and contradicts the purpose of the amateur radio service. The other is a threat to our safety. They both involve encrypted data on the ham bands.

I earned my amateur radio license at age 12. This exciting hobby pulled me into the field of Electrical Engineering, a career that supports US energy independence, and the creation of a company that employed 14 people. My story resembles those of many other hams. Yes, amateur radio is not just about yakking on the radio about mundane or geeky topics and providing spontaneous and critical community service for events and emergencies, it also fosters USA's global technical innovative leadership and economic growth.

Thus, you may agree with me that it's important that this resource enjoy thoughtful and considered attention as it changes with the times. In that spirit, I ask you to consider the following perspective:

The ham bands have always hosted new and innovative activities. One such activity is the use of the amateur radio service spectrum for personal and commercial email communication between land and boats at sea. This is not a problem *per se*, but it is a problem as currently practiced. It is innovative in that it cleverly avoids the use of other available email radiocommunication services and creates a business opportunity that uses strictly non-commercial spectrum to enable the email companies and hardware/software providers to make money. Business innovation is important, but it does not belong on the ham bands and it should follow the rules. Many hams, myself included, innovate in the business world, but we don't use the ham bands for our commercial projects.

Many of the digital communications carrying the email traffic cannot be understood by most other hams. The telemetry is coded in such a way that one has to purchase hardware and/or software to decode it, and even when so equipped, some of the transmissions still cannot be understood by the casual listener! The amateur radio service helps sustain itself (minimal cost to FCC) by being self-policing. How can we police ourselves when we can't understand the content of what we hear? How many of these transmissions are illegal because they're unlicensed? Which ones are illegal because they're commercial? Which ones contain logistical planning information to support malevolent deeds aimed at US citizens or our country?

The FCC amateur radio service rules forbid the encrypting of information to obscure its content from others for good reason. I suggest that this prohibition be broadened slightly to include encryption or coding that prevents the essential self-policing nature of the service. In order to innovate, hams still need to encode the information, but they also publish descriptions of the codes so that anyone can figure out what is being said.

The HF email system, as currently practiced, also violates FCC's "listen-before-you-transmit" rule that is critical in maintaining the cooperative nature of the amateur radio service. The computers that move the email traffic cannot

and/or do not discern whether a given frequency is clear before transmitting. Some additional innovation might be able to resolve this, but it seems to need some encouragement.

For the short term, the **please retain the data rate limit proposed for elimination** because it limits the proliferation of this abuse of the amateur radio service spectrum. Unfortunately, the data rate limit also may have the effect of hampering innovation in other areas as others have argued. **Thus, it is urgent that the problem of the aforementioned abuse of the amateur radio service be stopped now.** The FCC can do this by notifying the companies making money and mariner users of the illegality of the practice and issuing a few citations and collecting some fines to get the providers and mariner community to take it seriously. This will open a niche for more-appropriate use of the HF airwaves by mariners. Once the email services are completely open-source and open-hardware so that hams everywhere can listen to and decode those communications, and the users are able to listen before transmitting, they can resume. Once FCC has forbidden the use of such de-facto encryption and the abuse has stopped, the FCC should remove the data rate limitation and substitute a bandwidth limitation while still limiting the email to digital subbands. This will enable hams to innovate both high data rate communication, and also techniques to minimize the bandwidth such transmissions occupy (I acknowledge that there is a fundamental limit to bandwidth reduction). The bandwidth limitation should be 2.8 kHz because it's easy to remember and most ham equipment in service now is already filtered to comply. Mariners can comply with this bandwidth limitation for their strictly personal communications using non-encrypted coding and take their commercial communications to paid service providers.

But hams still need to innovate. How can we push higher data rates when propagation paths keep changing? To figure it out, we need to do it. Therefore, I suggest that a small subset of the part of the 80, 40, 20, 15, and 10 meter HF bands that's already allocated for digital communications be permitted by rule to carry data with bandwidth up to 10 kHz (after the abuse of digital modes has been stopped). The segments on 40-15 meters need to be quite narrow (I suggest 20 kHz) to avoid taking spectrum away from other uses. It could be a little wider (40 kHz) on 80 and 10 meters because there's more room. Having a narrow segment for high data rate communications would also force another desirable innovation: how to distinguish multiple signals from each other and how to adjust data rate automatically to optimize performance in varying conditions.

Finally, I have a comment regarding others' claims that bandwidth or data rate limits impair the emergency communication function of amateur radio. I am an active participant in my local amateur radio club which has an emergency communication focus. We live in an isolated place connected to the continental USA by a road through Canada. We lack ferry service. The current data rate limitation is not one of our present challenges as we train and equip ourselves to provide emergency communication services to our community. In a few years, once FCC has stopped the aforementioned abuse of the amateur radio spectrum and raised the data rate or bandwidth limit, then we might be ready to increase our use of digital modes on HF. If we do so, I intend to advocate that we do so using protocols that are open-source, open-hardware, readily available to anyone who wishes to listen to our communications, compliant with the FCC rules, and use data rates that reflect actual needs in order to be respectful of other spectrum users.

Thank you for considering my input to these critical decisions.

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